TECHNICAL REPORT

# ISO/TR 3834-6

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2007-02-15

# Quality requirements for fusion welding of metallic materials —

## Part 6: Guidelines on implementing ISO 3834

*Exigences de qualité en soudage par fusion des matériaux métalliques —*

*Partie 6: Lignes directrices pour la mise en application de l'ISO 3834*



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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.



Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 3834-6 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Unification of requirements in the field of metal welding*.



ISO/TR 3834 consists of the following parts, under the general title *Quality requirements for fusion welding of metallic materials*:

— *Part 1: Criteria for the selection of the appropriate level of quality requirements*

— *Part 2: Comprehensive quality requirements*

— *Part 3: Standard quality requirements*

— *Part 4: Elementary quality requirements*

— *Part 5: Documents with which it is necessary to conform to claim conformity to the quality requirements of ISO 3834-2, ISO 3834-3 or ISO 3834-4*

— *Part 6: Guidelines on implementing ISO 3834* [Technical Report]

Requests for official interpretations of any aspect of this part of ISO 3834 should be directed to the Secretariat of ISO/TC 44/SC 10 via your national standards body, a complete listing of which can be found at http://www.iso.org.

# Introduction

Welding is a special process in that the final result may not be able to be verified by testing. The quality of the weld is manufactured into the product, not inspected. This means that welding normally requires continuous control or that specific procedures be followed, or both. ISO 3834 deals with quality requirements in welding and has been prepared in order to identify those controls and procedures.

ISO 3834 is not a quality system standard intended to take the place of ISO 9001, but a useful, additional tool for use when ISO 9001 is applied by manufacturers, in which case the meeting of its requirements needs to be recorded in certificates or documentation. However, ISO 3834 can be used independently of ISO 9001.

ISO 3834 is intended for the fusion welding of metallic materials, and its application is independent of the products manufactured. However, its principles and many of its detailed requirements are also relevant for other welding and welding-related processes.

Among other International Standards covering resistance welding and thermal spraying are ISO 14554 and ISO 14922, respectively.

One of the aims of ISO 3834 is to define requirements in the field of welding so that contracting parties or regulators do not have to do this themselves. A reference to a particular part of ISO 3834 should be sufficient to demonstrate the capabilities of the manufacturer to control welding activities for the type of work being done. This concept also applies to committees responsible for drafting product standards.



ISO 3834 does not in itself require external assessment or certification. However, assessments by customers and certification by independent bodies are growing trends in commercial relations and the standard can serve as a basis for these purposes, as well as for the demonstration of performance by those manufacturers implementing it.

# Quality requirements for fusion welding of metallic materials —

# Part 6:
# Guidelines on implementing ISO 3834

## 1 Scope

This part of ISO 3834 gives guidelines for the implementation of requirements given in the other parts of ISO 3834, and is intended to help manufacturers and users select that part of ISO 3834 appropriate to their needs. It is expected that they will already be familiar with ISO 3834 as a whole.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.



ISO 3834-1:2005, *Quality requirements for fusion welding of metallic materials — Part 1: Criteria for the selection of the appropriate level of quality requirements*



ISO 3834-2, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

ISO 3834-3, *Quality requirements for fusion welding of metallic materials — Part 3: Standard quality requirements*

ISO 3834-4, *Quality requirements for fusion welding of metallic materials — Part 4: Elementary quality requirements*

ISO 3834-5, *Quality requirements for fusion welding of metallic materials — Part 5: Documents with which it is necessary to conform to claim conformity to the quality requirements of ISO 3834-2, ISO 3834-3 or ISO 3834-4*

## 3 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

IWE international welding engineer

IWS international welding specialist

IWT international welding technologist

NDT non-destructive testing

PWHT post-weld heat treatment

pWPS preliminary welding procedure specification

WI work instruction

WPQR welding procedure qualification record

WPS welding procedure specification

# 4 Using ISO 3834

## 4.1 General

ISO 3834-1 provides criteria for the selection and use of ISO 3834 as a whole. The following subclauses identify different ways whereby the manufacturer may select or be required to adopt ISO 3834.

## 4.2 Product standards

Where product standards require control of fusion welding, ISO 3834 should be used to organize those welding activities.

Product standards where compliance with ISO 3834 is required include EN 1090, EN 12732, EN 12952, EN 13445 and EN 15085.



## 4.3 Purchasers and users

Purchasers and users of welded products may specify in contract documents that manufacturers demonstrate their competence by compliance with ISO 3834.



## 4.4 Quality management systems in accordance with ISO 9001

Since ISO 9001 does not include specific requirements for welding activities, ISO 3834-2, ISO 3834-3 and ISO 3834-4 should be used.

## 4.5 Quality management systems other than ISO 9001

For welding activities in quality management systems other than ISO 9001 that do not include specific requirements for welding activities, ISO 3834-2, ISO 3834-3 and ISO 3834-4 should be used.

## 4.6 Manufacturers

Whenever manufacturers wish to give evidence of their competence in fusion welding activities, the appropriate part of ISO 3834 should be used.

# 5 Incorporating ISO 3834 in product standards

An important group of users of ISO 3834 is the committees that draft product standards at the international, regional and national levels. ISO 3834-2, ISO 3834-3 and ISO 3834-4 provide a range of quality requirements for welding. Committees drafting product standards are encouraged to select a part, or parts, of ISO 3834 that provide the appropriate quality requirements for the products to be manufactured, taking account of the selection criteria given in ISO 3834-1:2005, Clause 5. Each part of ISO 3834 is designed to provide a complete set of quality requirements; additional requirements should not need to be specified unless very compelling reasons exist. In case of doubt, or where additional requirements are being considered, consultation with ISO/TC 44/SC 10 is recommended.

Where welding is involved in the manufacture of a product, the standards committee may define the documents to be applied or else take them from the ISO documents specified in ISO 3834-5. The committee should also select the appropriate quality requirement standard or standards to be applied. Where a series of levels exist in the ISO documents in ISO 3834-5, e.g. for welding procedure qualification, it would be satisfactory for the standardization committee to select only those that would be acceptable. The development of tables linking parts of ISO 3834 (with or without other quality-related standards such as ISO 9001) to requirements other than those given in ISO 3834, is strongly discouraged.

## 6 Using other documents with ISO 3834

Full conformity with ISO 3834-2, ISO 3834-3 and ISO 3834-4 may be achieved either by adopting the ISO documents according to ISO 3834-5, or applying other standards that provide equivalent technical conditions.

Standards that do not provide equivalent conditions may be adopted if they are referenced in product standards that are used in full by the manufacturer.

Product standards that have been operated satisfactorily in service may be considered by a manufacturer as being recognized for application with ISO 3834. Where a manufacturer bases his demonstration of conformity to ISO 3834 on product standards, it is the responsibility of the manufacturer to apply the corresponding standards — whether separately specified or incorporated in the product standard — in their totality. It is the responsibility of the manufacturer to demonstrate technically equivalent conditions when standards other than the ISO documents according to ISO 3834-5 are applied. Certificates issued following assessment by independent certification organizations or claims of compliance by a manufacturer with any part of ISO 3834 should clearly identify the documents used by the manufacturer and provide or reference evidence of technical equivalence as applicable.



## 7 Documentation and quality systems



### 7.1 Documentation

In any control system there is a need for documentation. The term *documentation* embraces a range of different types of documents such as procedures, records, instructions and certificates (see Table 1).

ISO 3834-2, ISO 3834-3 and ISO 3834-4 require certain documents to be produced. Annex A gives examples of the types of documents which may be used by manufacturers.

**Table 1 — Examples of different types of welding-related documents**

| Type of document | Description [a] | Examples of welding coordinator |
|---|---|---|
| Procedure | Description of welding-related activity | Description of the role (tasks, responsibilities and authority) of welding coordinator<br>Description of the handling of welding consumables and parent metals<br>Description of how welding procedure tests are carried out<br>Description of how welder's qualification is carried out |
| Record | Report of welding-related activity | Record from a procedure test (WPQR)<br>Record from a welder qualification test<br>Welding record |
| Instruction | Description of welding-related operation | Welding procedure specification (WPS)<br>Work instructions |
| Certificate | Verification of welding-related operation | Welder's qualification test certificate<br>Material test report |

[a] Not to be confused with a definition of the terms.



## 7.2 Quality system

ISO 3834 does not specifically require a quality management system. However, ISO 3834-1:2005, Clause 6, identifies those elements that could be considered as complementing ISO 3834 if a quality management system were to be adopted. Of these, a most important one is document control, and manufacturers are expected to implement a document control procedure ensuring that



— documents are maintained up to date,

— those in receipt of documents are identified,

— the latest issues of the documents are available at locations where they are used,

— obsolete documents are withdrawn,

— records are archived to avoid deterioration and to enable retrieval, and

— records are not destroyed without authorization.

Some of the records generated as part of this system require updating at periodic intervals. These include calibration/validation records and welder qualification records.

Manufacturers who operate a quality management system conforming to ISO 9001 are expected to have a documented system in place covering those elements identified in ISO 3834-1:2005, Clause 6.

The effectiveness of the welding control system will depend to a large extent on the input from top-level management and their role in monitoring performance and implementing action when weaknesses are detected. Applying management review and internal audit ensures top management involvement in the welding control system and enables the monitoring of performance and introduction of measures to overcome identified deficiencies. Figure 1 provides a summary of critical measures in the welding control system to assist management review of the performance of the welding control system.

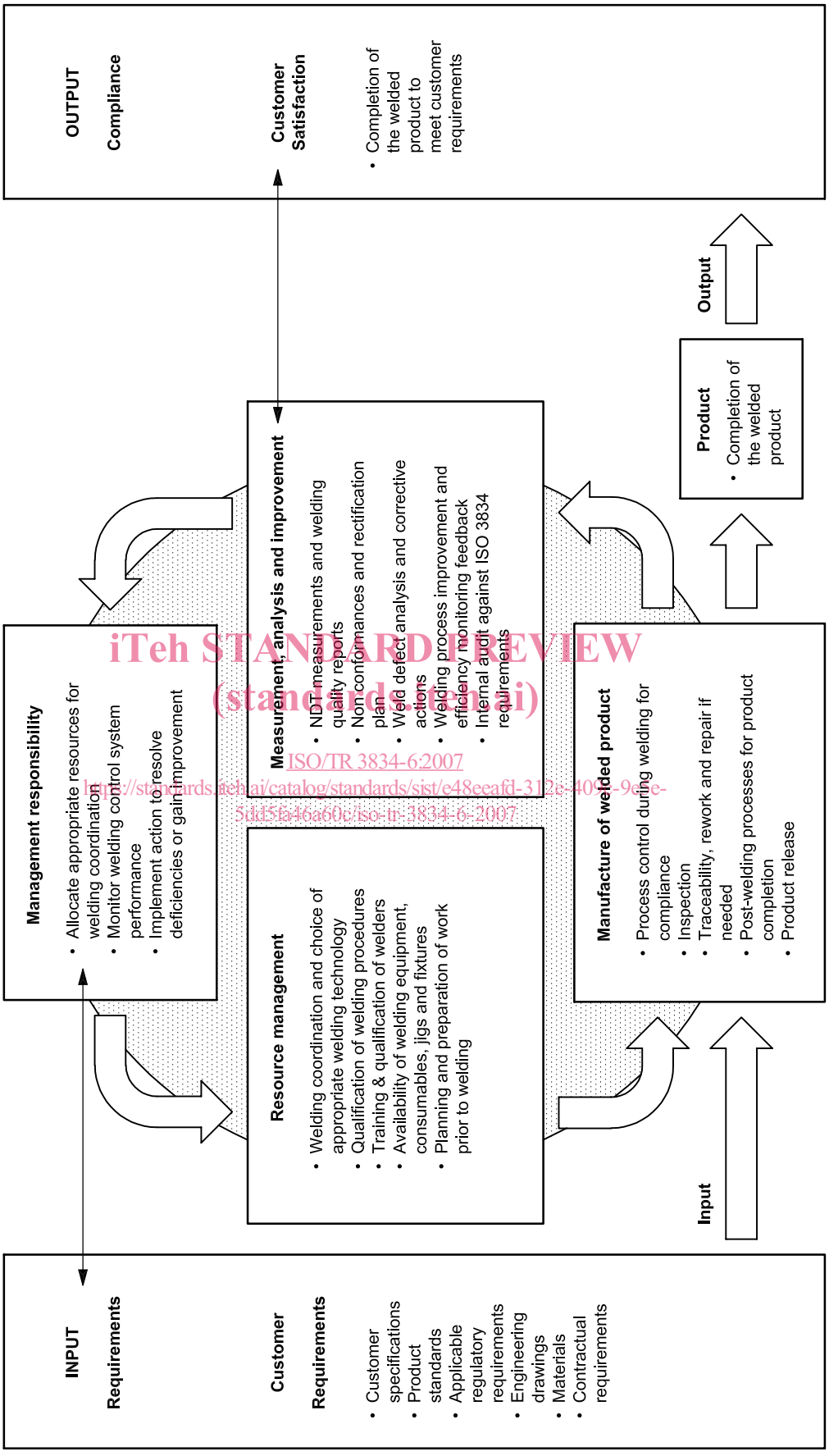




**Figure 1 — Summary of welding system control measures**